

# SN3262 – Network Administration, Management and Security

## Exercise 2: Using Scripts to Investigate the Status of Machines on a Network

The student machines are on three subnetworks 149.170.11.0, 149.170.13.0 and 149.170.20.0. This exercise will eventually require you to write a script to test to see which machines on the student network listed in the `/etc/hosts` are up and running Linux.

1. The student machines are on three subnetworks 149.170.11.0, 149.170.13.0 and 149.170.20.0. Why will a broadcast ping to the 149.170.11.0 or 149.170.13.0 from a machine on the 149.170.20.0 network **NOT** enable you to test which machines are running Linux on those networks?

What happens if you try?

Try and discover the IP addresses of the interfaces of the router interconnecting the three student networks.

2. For our purposes a script consists of a series of command lines, possibly with additional control structures, stored as a text file that is then executed.

### Example

```
#!/bin/bash
# simple bash script to list sub-directories only
ls -l > tmpfile
gawk '{if ($1 ~ /^d/) print $8}' tmpfile
rm tmpfile
```

This could have been written as:

```
#!/bin/bash
# another simple bash script to list sub-directories only
ls -l | gawk '{if ($1 ~ /^d/) print $8}'
```

Write one of the above scripts in a text editor. Save it as `subdir.sh`. Change its mode to make it executable and then execute it.

3. Read the introductory sections of the following Bash manuals:  
<http://www.tldp.org/LDP/Bash-Beginners-Guide/Bash-Beginners-Guide.pdf>  
<http://www.gnu.org/software/bash/manual/bash.html>  
<http://www.tldp.org/LDP/abs/html/>

4. Read the man page for *xargs*.

Write a script, consisting of command line statements, using *gawk* to read the contents of `/etc/hosts` to extract the Linux IP addresses of the machines on each of the student subnets and then to *ping* them and by parsing the output of ping, using *gawk*, determine if the machine is ‘up’ (running Linux) or ‘down’ (not connected or running XP).

**Example output**

```
149.170.11.1    Down
149.170.11.2    Down
149.170.11.3    Up
149.170.11.4    Up
149.170.11.5    Down
.
.
```

5. Read *Chapter 6. Exit and Exit Status* at <http://www.tldp.org/LDP/abs/html/exit-status.html>  
What does the following script do?

```
#!/bin/bash
ping -c 1 -w 1 149.170.13.8 > /dev/null
echo $?
```

What would the output of the following be?

```
#!/bin/bash
ping -c 1 -w 1 149.170.20.164 > /dev/null
echo $?
```

Note: 149.170.20.164 is an ‘XP’ machine.

6. Write a script using the *for ... in ... do ... done* and the *if ... then ... else ... fi* structures making use of *gawk* and *ping* to determine which machines on the 149.170.20.0 subnet are running Linux.

**Example of sort of output required**

```
149.170.20.7    Up
149.170.20.10   Up
149.170.20.32   Up
149.170.20.33   Up
149.170.20.34   Up
149.170.20.35   Down
149.170.20.36   Up
.
.
```